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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/579,306      | 05/16/2006  | Guofu Zhou           | NL 031350           | 1712             |

24737 7590 02/05/2009  
PHILIPS INTELLECTUAL PROPERTY & STANDARDS  
P.O. BOX 3001  
BRIARCLIFF MANOR, NY 10510

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| EXAMINER |
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KETEMA, BENYAM

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| ART UNIT | PAPER NUMBER |
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2629

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| MAIL DATE | DELIVERY MODE |
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02/05/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                    |  |
|------------------------------|--------------------------------------|------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/579,306 | <b>Applicant(s)</b><br>ZHOU ET AL. |  |
|                              | <b>Examiner</b><br>BENYAM KETEMA     | <b>Art Unit</b><br>2629            |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 May 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 May 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Claims 1-18 are presented for examination.

#### ***Priority***

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. EPO 03104295.5, filed on 11/21/2003.

#### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3 and 8-18 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. PG Pub No. 2003/0137521A1 (Zehner et al.).

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As in **Claims 1, 16, 17 and 18**, Zehner et. al. Discloses *a device, method, apparatus and drive waveform of*

- *An electrophoretic display device (Paragraph 2, line 3-6) comprising*
- *an electrophoretic material comprising charged particles (8, 9) in a fluid (10), (Paragraph 2, line 6-14)*
- *a plurality of picture elements (Paragraph 89, line 8-24 ),*
- *a first and second electrode (5, 6) associated with each picture element, the charged particles (8, 9) being able to occupy a position being one of a plurality of positions between said electrodes (Paragraph 2, line 6-14) ,*
- *said positions corresponding to respective optical states (Paragraph 160, line 7-9)*
- *of said display device, and drive means arranged to supply a drive waveform to said electrodes (5, 6), said drive waveform (Paragraph 90, line 1-11) comprising;*
- *a sequence of drive signals to be applied during respective image update periods, each drive signal effecting an image transition by causing said particles (8, 9) to occupy a predetermined optical state corresponding to image information to be displayed, (Paragraph 163., line 1-10)*
- *wherein a drive signal is applied, during each image update period, to every pixel in respect of which substantially no optical state change is required from the optical state effected during an immediately previous image update period, which drive signal is of a polarity and duration to cause said charged particles to move back toward said optical state effected during said immediately previous image*

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*update period.* (Fig 8, item 306 and 308) shows drive signal (write period) followed by new image as shown in finger 8,9,10.

As in **Claim 2**, Zehner et al. discloses *display device* (Fig 1 item 26) *according to claim 1, wherein the drive waveform includes a reset pulse, prior to a drive signal.* (Paragraph 150, line 1-3 and Fig 8-10) Fig 8-10 shows a reset pulse (304) being applied before the drive waveform (306 write period) in order to display new image.

As in **Claim 3**, Zehner et al. discloses *display device* (Fig 1 item 26) *according to claim 2, wherein the reset pulse, prior to a drive signal, comprises an additional reset duration.* (Paragraph 150, line 1-3 and Fig 8-10) Fig 8-10 shows a reset pulse (304) being applied before the drive waveform (306 write period) in order to display new image.

As in **Claim 8**, Zehner et al. discloses *display device* (Fig 1 item 26) *according to claim 1, comprising two substrates, at least one of which is substantially transparent, whereby the charged particles (8, 9) are present between the two substrates.* (Paragraph 11, line 1-5 and Paragraph 12, line 1-11)

As in **Claim 9**, Zehner et al. discloses *display device* (Fig 1 item 26) *according to claim 1, wherein the charged particles (8, 9) and the fluid (10) are encapsulated.* (Paragraph 11, line 1-5 and Paragraph 12, line 1-11)

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As in **Claim** 10, Zehner et al. discloses *display device* (Fig 1 item 26) *according to claim 9, wherein the charged particles (8, 9) and the fluid (10) are encapsulated in the form of individual microcapsules each defining a respective picture element.* (Paragraph 11, line 1-5 and Paragraph 12, line 1-11)

As in **Claim** 11, Zehner et al. discloses *display device* (Fig 1 item 26) *according to claim 1, having at least three optical states.* (Paragraph 167, line 1-5) discloses at least three optical states black, dark gray, light gray and white.

As in **Claim** 12, Zehner et al. discloses *display device* (Fig 1 item 26) *according to claim 1, wherein the drive waveform is pulse width modulated.* (Paragraph 71, line 16-20)

As in **Claim** 13, Zehner et al. discloses *display device* (Fig 1 item 26) *according to claim 1, wherein the drive waveform is voltage modulated.* (Paragraph 71, line 2-11)

As in **Claim** 14, Zehner et al. discloses *display device* (Fig 1 item 26) *according to claim 1, wherein at least one individual drive waveform is substantially dc-balanced.*  
(Paragraph 196, line 1-13)

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As in **Claim 15**, Zehner et al. discloses *display device* (Fig 1 item 26) *according to claim 1, wherein at least some of the subsets of closed loops wherein an image transition cycle causes a pixel to have substantially the same optical state at the end of said cycle as at the beginning, are substantially dc-balanced.* (Paragraph 196, line 1-13) discloses when sequence of transitions beginning and ending in one optical state of pixel should be DC balanced.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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7. Claims 4-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zehner et al. (U.S. PG Pub No. 2003/0137521A1) in view of Machida et al. (PG Pub 2002/0196207)

As in **Claim 4**, Zehner et al. discloses *display device* (Fig 1 item 26) as discussed above, but fails to disclose *one or more shaking pulses are provided in the drive waveform*. However, Machida et al. (See Fig 9 item initializing drive pulses) discloses a series of shaking pulses (initializing drive) are being applied in drive waveform. Zehner et al. and Machida et al. are analogous art because they are from the common area of electrophoretic display and represent known Display alternatives. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the references (Zehner et al. and Machida et al.) because Machida et al. suggests the application of shaking pulses effectively releases or loosen the particles from their current position so that they can be addressed by driving a pulse to the appropriate optical state to enhance the display quality. It also provides method for addressing a bistable display element having first and second display states differing in at least one optical property. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the display device of Zehner et al. by applying a series shaking pulses as disclosed by Machida et al. because Machida et al. suggests the application of shaking pulses effectively releases or loosen the particles from their current position so that they can be addressed by driving a pulse to the appropriate optical state to enhance the display quality, as found in claim 4.



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As in **Claim 5**, Zehner et al. discloses *display device* (Fig 1 item 26) as discussed above, but fails to disclose *one or more shaking pulses may be provided prior to a drive signal*. However, Machida et al. (See Fig 9 item initializing drive pulses and Paragraph 31) discloses a series of shaking pulses (initializing drive) are being applied before and after driving (voltage) pulses. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the display device of Zehner et al. by applying a series shaking pulses before and after driving (voltage) pulses as disclosed by Machida et al. because Machida et al. suggests the application of shaking pulses effectively releases or loosen the particles from their current position so that they can be addressed by driving a pulse to the appropriate optical state to enhance the display quality as found in claim 5. The same reason used to combine Zehner and Machida in claim 4 is applicable to claim 5.

As in **Claim 6**, Zehner et al. discloses *display device* (Fig 1 item 26) as discussed above, but fails to disclose *an even number of shaking pulses are provided in the drive waveform*. However, Machida et al. (See Fig 9 and Paragraph 106 lines 12-15) discloses an even number of shaking pulses (initializing drive pulse) are being applied to the display. Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the display device of Zehner et al. by applying the shaking pulses as disclosed by Machida et al. because Machida et al. suggests the application of shaking pulses effectively releases or loosen the particles from their current position so that they can be addressed by driving a pulse to the appropriate

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optical state to enhance the display quality, as found in claim 6. The same reason is used to combine Zehrer and Machida in claim 4 is applicable to claim 6.

As in **Claim 7**, Zehner et al. discloses *display device* (Fig 1 item 26) as discussed above, but fails to disclose *the shaking pulse has an opposite polarity to the subsequent data pulse when a single shaking pulse is applied*. However, Machida et al. (See Fig 9) discloses a series of shaking pulses (initializing drive, +-300v) that has opposite polarity of subsequent data pulse. Machida et al. discloses the use of shaking pulses to solve the problem of particles being adhere to one side of the capsule. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention to modify the display device of Zehner et al. by apply shaking pulses that is opposite in polarity as to effectively release or loosen the particles from their current position so that they can be addressed to appropriate optical state.

### **Prior Art**

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent No US PG Pub No. 2002/0005832 discloses electrophoretic display, resetting period and writing period, an image data is supplied to a data line drive circuit and a gradation voltage is applied to each pixel electrode. Webber (US PG Pub No. 2002/0180687) discloses electrophoretic display comprises a plurality of particles suspended in a suspending fluid.

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BENYAM KETEMA whose telephone number is (571)270-7224. The examiner can normally be reached on Monday- Friday 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shalwala Bipin H can be reached on 571-272-7681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ Benyam Ketema /

Examiner, Art Unit 2629

/Bipin Shalwala/

Supervisory Patent Examiner, Art Unit 2629